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ABSTRACT

Rigorously articulated conversational studies (based on George Kelly's personal construct theory) of the reading of complete texts raise new questions about the cognitive processes by which meaning is attributed to the printed word. Four generative models are examined: probabilistic, phrase structure, transformational, and semantic. No single model provides a universal explanation, although each illuminates certain parts of the conversational results. A "capacity for process" model, in which a variety of individually specific "programs" can be run, is outlined, suggesting that each reader operates more than one specific model. This superordinate model facilitates learning-to-learn conversations in which reading effectiveness changes significantly. (Author)

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Conversational Investigations of Reading

New Insights into Cognition

Laurie F. Thomas & E. Sheila Augstein, Harri-.

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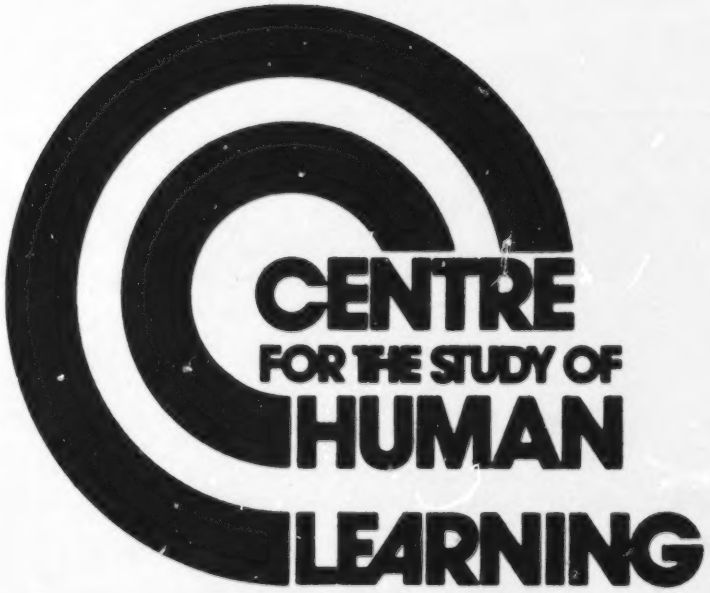

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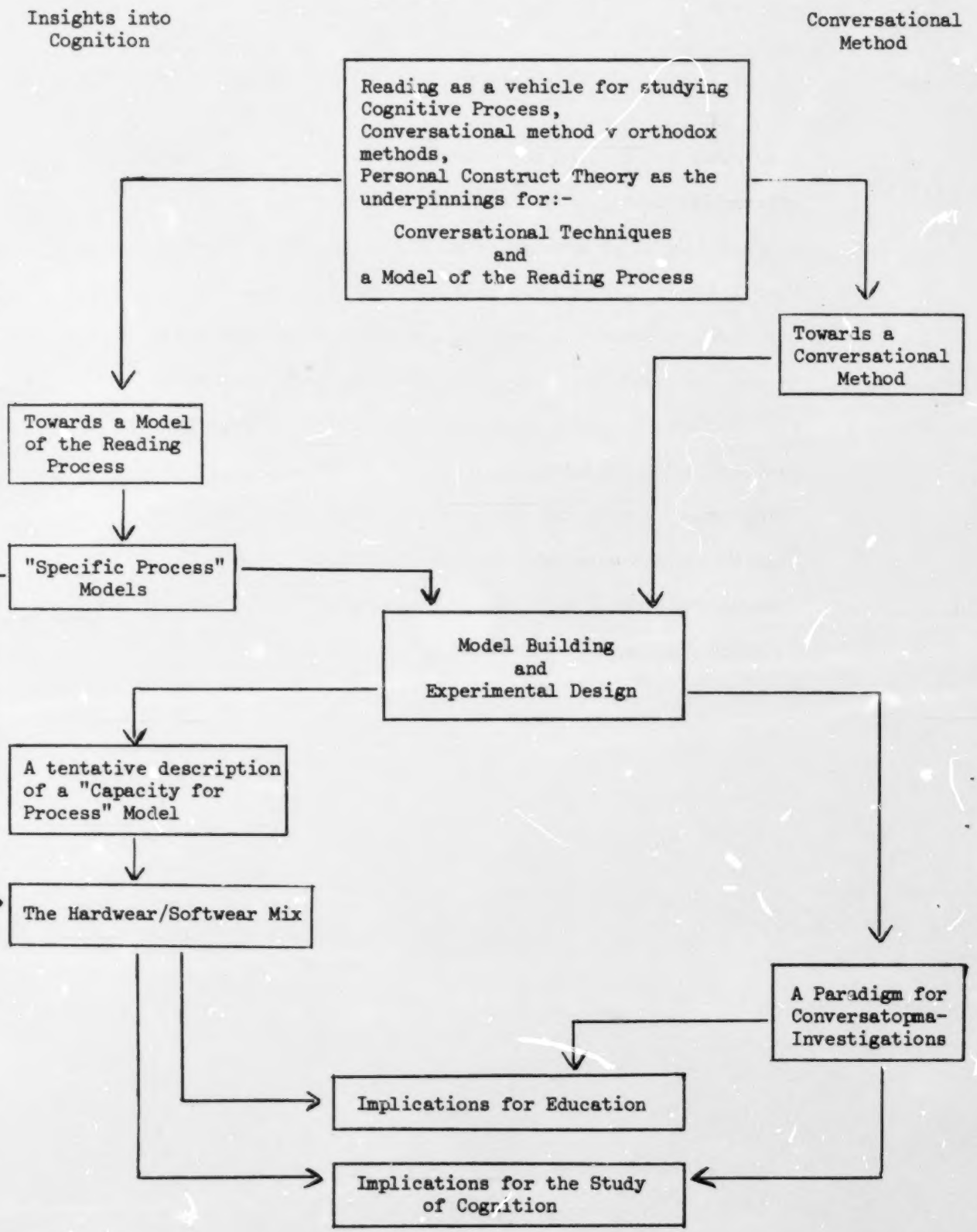
Abstract

Rigorously articulated conversational studies of the reading of complete texts, raise new questions about the cognitive processes by which meaning is attributed to the printed word. Four generative models are examined: probabilistic, phrase structure, transformational and semantic. No single model provides a universal explanation although each illuminates certain parts of the conversational results. A "capacity for process" model, in which a variety of individually specific "programmes" can be run, is outlined, suggesting that each reader operates more than one specific model. This superordinate model facilitates Learning-to-Learn conversations in which reading effectiveness changes significantly.

A Flow Diagram of this Article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Conversational Investigations of Reading; New Insights into Cognition

Language is a defining characteristic of man. The written word is probably the most considered and controlled mode of language. Writing and reading involve the participant in actively generating "Structures of Meaning," compatible with a particular event (Thomas & Augstein, 1973). Whilst the writer responds to his own inner processes and can be thought to be in either the transactional or spectator roles (Britten, 1970) the reader relies on the black hieroglyphics on the page as stimulus for his attribution of meaning. The authors of this paper have developed a conversational methodology, empirical tools, and a theoretical framework for observing the process of reading, and they have found that together these provide a unique vehicle for the study of cognitive processes.

The conversational approach recognises that the act of observing influences the activity being observed. Experimenter and subject together share the responsibility for the observation and measurement of a continuously changing cognitive process within a "context sensitive" framework. Thus the empirical investigation becomes a co-operative effort. The results of a conversational study concerned with the measurement of changes in the cognitive processes of reading are reported elsewhere (Thomas & Augstein, 1975a). This paper describes a paradigm for such conversational investigations and formulates the parameters for "specific process" models and a "capacity for process" model of reading.

Until recently, the widely accepted tenets of experimental method have largely restricted the psychological investigation of reading to the short term recall of strings of letters, words, phrases, and sentences. The complex stimulus of a text (sentences, paragraphs, sections and chapters) offers a rich empirical resource for investigating sophisticated cognitive processes. The text serves as a common referent, but the meaning attributed to it varies from person to person. Subjects bring years of practice and uniquely personal experience into the laboratory and this can be effectively tapped by combining the rigour of behavioural recording procedures with the individuality of the experiential approach. Moreover, the highly developed skill of reading is completely learnt, so that its acquisition can be investigated in its many forms and at any stage of development.

The orthodox cognitive experiment uses stimuli which are "completely known" to the experimenter. Piaget's less orthodox studies assumed that the experimenter's view was comprehensive, and that children grow to understand materials, relations, processes and events more "correctly" as they develop (Piaget, 1961). Even Osgood's semantic differential imprisons meaning within a pre-established set of universal dimensions (Osgood, 1952). In a conversational investigation of reading, any preconceptions which the experimenter harbours about meaning are rapidly dispersed. The subject's attribution of meaning may be entirely different. Mismatch of meaning is recognised and used in

the conversational exercise. Any method which evaluates meaning only by reference to a pre-established "correct" version inevitably discards most of the information relevant to a more complete and significant understanding of the cognitive processes involved in its attribution.

George Kelly offers a theoretical position within which the attribution of patterns of meaning can be investigated without such normative reference. Personal construct theory (Kelly, 1955) recognises that each person generates his or her own dimensions, constructing models of themselves and their environment, testing these out in action, and revising and developing meaning until it works adequately for their purposes. This view of "man as scientist" can be applied usefully to the study of cognitive processes involved in reading.

Personal construct theory forms the underpinnings of the conversational research paradigm and for considering the parameters for a model of the reading process. Such parameters must include the ability to generate meaning, map meaning on to the hieroglyphics on a page, assess its validity in terms of personally relevant criteria and invent, review, and change meaning until a personally acceptable match is achieved. The process applies equally to letter and word recognition, and to the appreciation of syntactic and semantic structures, at different levels of text organisation. A reader's criteria for matching meaning with a text, vary much more widely than do those of scientists in the orthodox sense. Personal knowing, private experiences, oblique and bizarre associations, all contribute. Meaning mapping, monitoring, reviewing, coupled with a

heterarchical view of process organisation present the scaffolding for a model of the reading process.

Towards a Conversational Method

The conversational approach adopted in our investigations accepts the subject as full participant in the descriptive and explanatory enterprise. It uses the subject's unique position as observer of his internal events and admits the personal validity of his attempts to understand his own processes. However, the experimenter has access to data and forms of explanation which are not available to the subject. With the technology at his disposal, he can observe and record the reader's behaviour rigorously. Such records can then be used to help the subject to introspect about the reading event. The experimenter and subject retrospectively reconstruct the original experience of reading, and relate it to intention and outcome. The advantage of the conversational technique lies in involving the subject in the explanation. He or she is unlikely to tolerate oversimplified or highly intellectualised descriptions of process. "Hard" systematic tools have been developed both for the behavioural and experiential observations (Thomas, Augstein & Farrés, 1973). These mediate to control "soft" unvalidated idiosyncratic explanations, and help to ensure the reliability and validity of the enterprise. A shared view of the investigatory process is also necessary.

Towards a Model of the Reading Process

The history of psychological theory building embodies many themes. One is that later theories often either reject or redefine the attributes assumed to be inborn by an earlier psychology, so that they are revealed as socially, culturally or

experientially determined. In computer terms new discoveries indicate that what was assumed to be human hardwear by a previous generation of theories, turns out to be the softwear of the next generation's internal programmes laid down and developed through experience. Conversational method allows us to explore human process in a much more immediate detailed and open way, than orthodox methods permit. "In context" observation and explanation yields richer data than inferences drawn solely from end results. These discoveries reveal that detailed processing is much more varied, flexible and complex than most inferred descriptions have allowed. To arrive therefore at a more adequate descriptive explanation it is useful to differentiate models which deal with a "general capacity for process" from those which are concerned with the "specific" nature of processing. Models which describe "specific processes" are often based on data that is experientially determined. These are softwear or performance models. A "capacity for process" model can fall into either rationalist or empirical camps. It represents the "now" boundary of debate between the assumed hardwear and recognised softwear. The fact that a process is widespread amongst humans and specific to them does not necessarily mean that it is inborn.

The "specific process" models of reading which are discussed in the next section, represent an attempt to articulate the experientially determined softwear activities which together contribute to the variety and complexity of the reading process. An outline of a "capacity for process" model which then follows, is an attempt to articulate the human hardwear, which could "run" the various softwear packages. Some of the latter have previously been

assigned hardwear status. This model is offered in the expectation that, as the frontiers of cognitive research are pushed forward, it in turn will be revealed as non-basic.

Specific Process Models

Various psychological models of specific process have been developed in psycholinguistics. Four major models are examined in an attempt to explain and predict the wide variety of meanings which a reader can attribute to a text. The simple sentence

"I like her drawing"

is used to critically appraise each model.

Model 1

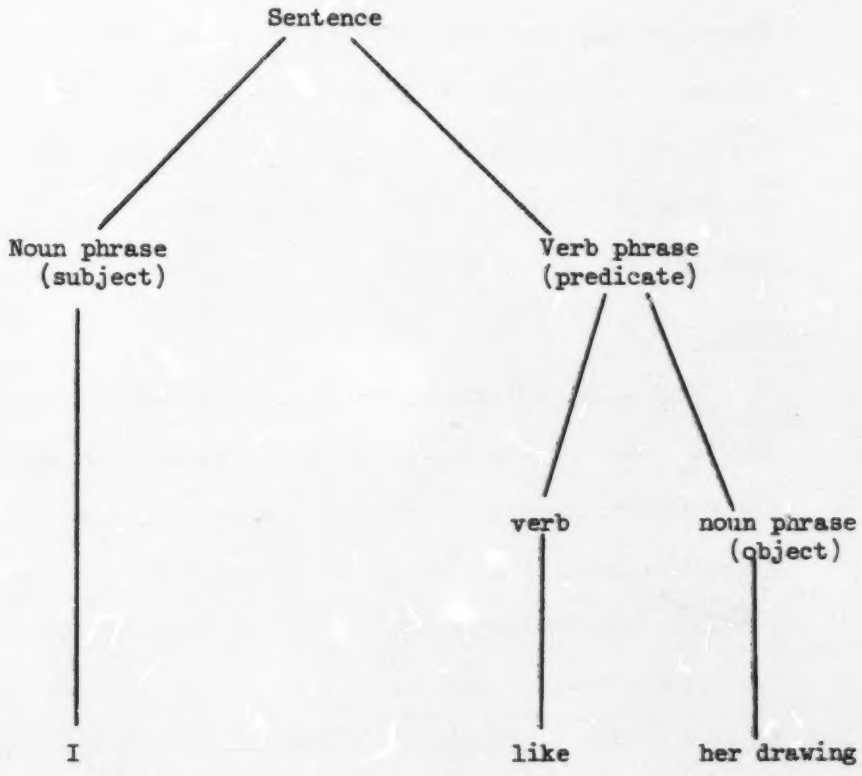
An early generative model derived from information theory is probabilistic (Miller, 1951). Meaning is generated by means of a series of choices, made from left to right. Each word stands for a concept and words are strung together, but not at random. There are restrictions on what follows what. The choice of "I" limits the choice of "Like" and the choice of "Like" limits the choice of "Her," and so on. The meaning of the sentence is obtained by adding the meanings of the component words. The meaning is linear and flows from left to right. Obviously, this simple probabilistic model is capable of considerable elaboration. Phrases, groups of phrases and sentences can be combined in this left to right sequence. The model becomes hierarchical in the sense that probability structures can be combined. The "intermediate skills" of reading have been accounted for on the basis of this type of collocation (Merritt, 1969). However, a more complex hierarchical

description goes beyond this probabilistic model.

Model 2

Meaning can be mapped onto the sentence by attributing to it a constituent structure (Chomsky, 1956).

This offers a more complex generative model. The meaning of the sentence is derived within a phrase marker structure.



The meaning of the sentence is constructed in a left to right and bottom to top hierarchical direction.

"I" modifies the meaning of the phrase "Like her drawing." The construction of meaning continues in both these directions until the reader has generated a meaning for the whole sentence.

Savin and others quote empirical evidence for this performance model (Savin & Perchanock, 1965). The results of our conversational study support this evidence (Augstein, 1971). However Chomsky has argued that models one and two are inadequate (1957). Words and phrases cannot be predicted simply by, and only by, knowing the word or phrase that precedes it. The constituent structure of many sentences is ambiguous, and therefore open to a wide variety of interpretation. The example sentence contains no ambiguous words, yet it is remarkably ambiguous. It can mean "I like what she draws," "I like the way she draws," "I like the fact that she draws," even "I like the fact that she is being drawn."

Model 3

Such a syntactically ambiguous phrase structure presents a crucial test for any model, which professes to explain and predict the reader's cognitive process. The example is an ordinary simple pedestrian English sentence. It is not easy to account for the reader's attribution of meaning to it. Chomsky introduces his transformational grammar to account for the attribution of meaning to such sentences (1965). For example "(I) (Like) (Her drawing)" can be thought to conceal different underlying deep structures. Transform rules convert phrase markers into surface structures by moving words around or by adding or deleting words. The ambiguity in the example sentence is explained by phrase structures of several different underlying sentences. Different transform rules operate to derive the same and therefore ambiguous surface phrase structure.

This model offers a more complex hierarchical description than models one or two. Again there is mounting evidence in the literature to support the validity of this type of performance model (Savin & Perchanock, 1965). The result of our study verifies this evidence (Augstein, 1973). Thus, the meaning which a reader can attribute to a sentence, depends not only on the linear sequence, nor the constituent structure but also on the complex inter-relationships it has with underlying structures.

Conversational studies in reading have shown that the varieties of meanings which can be attributed to a sentence or larger piece of text depend on "context." Specifically, there are two kinds of context. The reader explores textual context as he searches backwards and forwards between phrases, sentences and paragraphs for cues to help him to attribute meaning. Goodman has identified a number of syntactic and semantic cues which operate within the context of a text (1974). The reader's self-defined purpose derives from and operates within a hierarchy which contributes to his personal repertoire of reading purposes. This idiosyncratic taxonomy of purposes provides another context which influences meaning attribution (Thomas & Augstein, 1975b).

Chomsky's model becomes immediately vulnerable, since his "semantic component" fails to take such contexts into account. The theory of "speech acts" made explicit by Searle (1972) exposes transformation grammar to a similar critique. According to him the theory of meaning embedded in "Syntactic Structures" is too impoverished to achieve its objective of explaining all the linguistic

relationships between sound and meaning. It cannot account for the fact that a sentence represents a "statement." For Searle semantic competence is in large part the ability to perform and understand.

Model 4

To consider the example sentence once more. How can one account for its semantic ambiguities? How does a reader attribute the appropriate sense for "Drawing?" A semantic model embodying "purpose" must be postulated to account for the interpretation or "reading" of the syntactic rules. The sense "Sketch," "Pulling out a pistol or dagger," "Fetching water from a well," "Tugging on a rope" and even "Putting on a poultice" has been inferred by readers, when the sentence "I like her drawing" was read out of context. In assigning to it a textual context, this ambiguity disappeared. Yet, even in context, different readers derived different meanings, according to their self-defined purposes. These meanings ranged from the bizarre, oblique and apparently illogical to the more conforming literal, reorganisational, evaluative and inferential responses compatible with a standard taxonomy of purposes, such as Barrett's (1968). Taxonomies which embody the views of one expert or a group of specialists, whilst useful in structuring intention and giving insights to the range of possible purposes, fail in practice to account for the infinitely variable structures of meaning which readers can generate. What is required is a semantic model which incorporates intentionality into the individual generative process.

If the reader accepts the conventional purpose of understanding what the author says, the task becomes "literal." Probabilistic and Chomskian models of process could account for the generation of the fairly convergent patterns of meaning which usually result from this task. Meaning attribution is based largely on the contextual cues within the text. More divergent purposes result in varieties of meaning, which are far removed from the text. To account for these phenomena a semantic model must embody "purposes" from the reader's own idiosyncratic taxonomy of purposes. Investigations using the Kelly repertory grid provide a vehicle for the articulation of such taxonomies, and these have been identified as uniquely personal (Augstein & Thomas, 1976).

Conversational research shows that during reading, purposes become refined, elaborated, modified, differentiated or completely changed. Different purposes for reading lead to different kinds of processing of the linear hieroglyphics which make up the words, sentences and paragraphs on a page. These are sampled, selected, and related in order to attribute a structure of meaning. The strategies and tactics which describe a person's reading behaviour can be related to purpose and outcome (Thomas & Augstein, 1972).

It becomes clear that a semantic model of the reading process must account for:-

1 The complexity and variety of structure in the reader's purposes, strategies and outcomes.

2. The hierarchical nature of each of these components.
3. The uniquely personal relationships which exist between these components of a person's system for attributing meaning.
4. The mechanisms by which the system is, or is not, brought under review.

Model Building and Experimental Design

Conversational techniques of research have allowed the whole underside of the syntactic stone to be revealed. What has been partially recognised by more orthodox methods becomes exposed and demands rigorous examination. Revulsion at the chaotic and bizarre meanings which the "untutored" achieve from a clear and precise text, (Augstein, 1971; Richards, 1964) may lead researchers to replace the stone and stay with hygienic methods, which embody their own preconceptions,but unprejudiced scrutiny involving the subject's participation reveals complexities and multiplicities of self-organisation in the chaos.

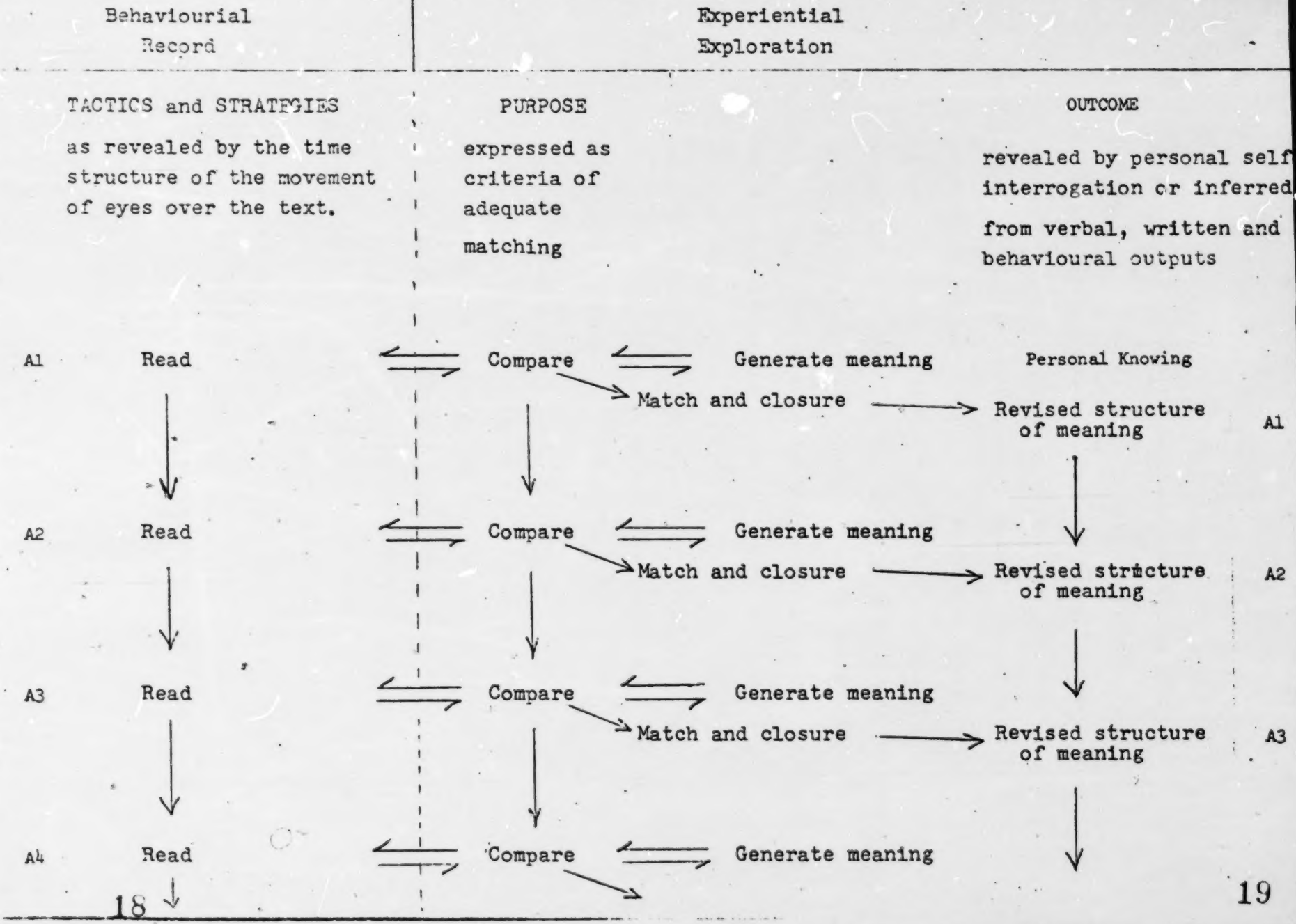
One definite finding is that contrary to the traditional experimenters' assumptions, readers do not generate and map meaning according to any one coherent model of specific process. Circumstances both external and emotional condition the mode of generation. Psychoanalysis has long recognised this, although its particular descriptions of alternate specific processes are not necessarily those attractiveto the current authors. Emotion does not eliminate cognition. It modifies, amplifies and controls it.

Studying cognitive life in its natural free flowing habitat reveals much that does not occur in the aquarium of the cognitive experiment. Conversational technique approximates to the field studies of Lorenz (1965). Cogno-ethological observations of free forms of reading, build up a bank of reading events, out of which a more adequate taxonomy of "specific process" models can be identified. The range and variety of the library of internal programmes in turn indicates more clearly the dimensions of a "capacity for process" model, which would be capable of "running" any of the programmes within it.

A tentative description of a "Capacity for Process Model"

A heterarchical view of the model appears relevant. But the organisation at any one level is essentially similar to that at any other level. Figure 1 illustrates how the process is conceived of as generating "Structures of Meaning." A1, A2, A3 are successive meaning generating activities. The content of the "A" can be graphemes, words, phrases, sentences, paragraphs, or longer sections of text. If the attribution of meaning is personally adequate (i.e. what is being compared matches), then the reader reads on. If it is inadequate, (i.e. mismatches) then the reader attempts to generate more appropriate meaning. Such mismatch is revealed in the time structure of his strategy. Changes in process result in a different level of monitoring. If A1, A2 and A3 are "sentences" then mismatch may lead to monitoring some of the "phrases" in A1, A2 or A3. Search and comparison at this lower

Figure 1. The Process of Meaning Generation



level may lead to match at the higher level. Match leads to closure, so that the meaning generated becomes incorporated into the long term store to form part of the individual's personal knowing. The alternative "structures of meaning" which a reader can generate from a finite set of words is infinite. In the short term meaning depends on the immediate purpose and that part of the text being processed. In the longer term, it relates to the higher order purposes and to the whole text. Thus, purpose within a hierarchy of purposes forms the basis against which comparisons are made and match is achieved.

Probabilistic, phrase structure, transformational, and semantic processes all occur in natural reading. To believe that one excludes the other is to ignore the data which already exists in socio-linguistics, biography and literature. Many other as yet unrecognised forms probably also occur. It is not sufficient to view reading as a generative process, on the lines that Miller (1962), Chomsky (1968), or Goodman (1967) suggest. The method for mapping meaning on to the text is itself generated (Augstein, 1971). This leads to the postulation of a type of capacity for process model, which is capable of generating the varieties of specific processes, which naturally occur.

Cognition is structured at many levels, but the assumption that there is one ultimate referent in the hierarchy is to ignore the multiple flow within such networks as the brain.

Perceiving the consequences of action can lead to a change in superordinate intention as easily as the holding of an intention in the face of non-responsive environments can lead to changes in strategy. The belief that "good cognition" is concerned with achieving a particular purpose arises from the orthodox paradigm of investigation (preplanned instruction and scoring). Heterarchies more adequately encompass the variety of free flowing cognition. A "capacity for process" model capable of handling natural reading must be heterarchical in form.

In the model described in Figure 1 the connections between the levels are multiple.

(a) The criteria of acceptable match vary from level to level. They relate one to the other via the purpose hierarchy, but it is only in the most vigorous and reviewed thinking that these relations are entirely logical, complete and and non-redundant.

(b) The methods of generating meaning at different levels also relate one to the other, but the mechanisms of generation are often personally idiosyncratic and multiple, combining into the cognitive style of the individual. This is only imperfectly described through the work of Klein, Messick Riley, Garder, Kogan and Wallach etc.

(c) Personal knowing (Polanyi, 1958) can be described as the heterarchical structure of achieved meanings as they relate to each other in a complex multiple network of personal constructs.

Formal language is a social construction; dictionaries, grammars are semi-statistically based compromises in which the usual (or elitist) becomes the referent. Mass communication and instructional programmes act as restricting and standardising agents against which individual meaning is judged, and moulded. It takes the skill and dedication of a Shakespeare, Joyce, Becket or Pinter to break linguistic moulds. Psychologically, any form of language that happens is permissible. In fact as with perceptual illusions, non-standard forms (dialect, idioms, restricted code) contribute most to our understanding of cognitive processing. Even the "sentence" has no unique claim as the basic source of meaning. Its centrality is an accident brought about by the level of complexity most convenient for the linguist. Less than a sentence restricts his opportunities for ingenious systemisation, more than a sentence exposes him to multiple complexities of meaning which are too rich to be imprisoned within any one consistent set of rules.

The Hardwear Softwear Mix

The idea of a "Capacity for process" within which a variety of "specific process models" can run, may appear to be a retreat from explanation, but it clarifies one of the fundamental issues underlying the controversies in psycholinguistics. Two widespread phenomena are worthy of note.

1. Many over-practised skills fall into non-consciousness, apparently irretrievably, when the exponent of the skill finds it almost impossible to explain how results are achieved.

Our study of reading has highlighted this issue.

2. The softwear nature of the cognitive organisation is recognised, because the skill is obviously learnt, but even so, one talks of natural aptitude. When a skill is acquired without tuition (listening, talking) one assumes that it is inborn. Ethological investigations illustrate how careful one must be to differentiate innate components, from the apparently universal, which develops from parallel experience (Lorenz, 1970).

Chomsky has claimed that the universality of certain characteristics across languages indicates the innate nature of transformation grammar (Chomsky, 1968). Conversational studies raise serious doubts about this claim. Many of the meanings attributed to a text are not compatible with the meaning implied by its syntactic structure. But they are compatible with "personal" assumptions about meanings implicit in string of words. The syntactic skill of the author is seldom the same as the reader. Often the semantic meaning is shared despite this; sometimes when they share a grammar, meaning is not conveyed (Augstein, 1971).

The newer semantic studies reported by Britten (1970), Searle (1972), Steinberg & Jacobovitz (1971), and Olsen (1975) have led to severe criticisms of Chomsky's assumptions about the relationship between syntactic and semantic structures. Conversational studies show considerable divergencies between the two. The lack of universality of "language usage," and of the generative mechanisms which produce them, throws the whole question of genetic endowment

into the arena of speculation. Our position is that an information handling structure as complex as the brain, undoubtedly has a vast "capacity for process." But this capacity is much more generalised than Chomsky claims. Much that appears universal is only statistically so, and much of that which is truly universal can be explained in terms of universal experience, imitation and the need to communicate with established language users.

A Paradigm for Conversational Investigations

The conversational technique, offered as an alternative to orthodox experimental procedures, is not to be viewed as an "ad hoc" chat. The design of the conversation must be as rigorous as that of an experiment, but different in kind. Because it comprises communication between two separate semi-autonomous nodes of planning and information, (the participant subject and the participant experimenter) the rigour must arise from a negotiated agreement to proceed with a joint model of investigation, and certain agreed tools for generating and collecting data. In the reading conversations the model was that of "purpose-strategy-outcome-review" (Augstein & Thomas, 1975). The tools were the Kelly repertory grid and the Thomas grid focusing technique for investigating the background processes of thoughts and feelings, which embody the needs that give rise to the often nebulous purposes of reading (Thomas, 1975). A purpose taxonomy was used to help the reader articulate his own structure of purposes (Augstein, 1971). The Brunel Reading Recorder was used to record the detailed reading behaviour, from which the strategy and tactics were reconstructed (Thomas & Farnes, 1972). The outcomes of reading were investigated by using a variety

of methods for eliciting and displaying the "Structures of Meaning" attributed to the text. Originally multiple choice tests and summarising exercises were used, but these were discarded for a system of "Structures of Meaning," including Flow diagrams and Meaning Nets. These allow the participant subject full freedom to express his own understandings (Jahoda & Thomas, 1966; Thomas & Augstein, 1975c). Thus the "purpose-strategy-outcome-review" model and the tools, within a conversational framework, allows the reader to exhibit his reading experience. The conversation itself often becomes the vehicle for constructive changes in the subject's reading competence. For this to be sustained the conversation must be trimorphic, i.e. contain three forms of dialogue. These are "Commentary on Process," "Supporting the Learner's Reflection" and "Referents for Evaluating Competence." In managing the conversation the participant experimenter makes available the tools and model and controls the three dialogues (Augstein & Thomas, 1975). The focus of the conversation is the reflection of process, the subject reflects on his reading process and the experimenter reflects on her management of the conversation. The results of using this conversational technique are described in more detail elsewhere (Thomas & Augstein, 1975a; Thomas & Augstein, 1975b).

Implications for Education

In using conversational techniques it immediately becomes clear that non-trivial participant investigations always yield an educational side effect. If significant results are achieved

the subject participant is not only aware of these results but that he has actively contributed to their discovery and construction. This is an ideal learning opportunity and is recognised as such by most of the participants.

Conversational results yield three sources of data, which become a resource for effective teaching/learning transactions.

(a) The specific results of the investigation may be useful in a given topic. The identification of specific relationships between "purpose-strategy-outcome," for reading is now being incorporated into reading curricula (Augstein & Thomas, 1973; Farnes,1973)

(b) The emphasis given to "process" rather than to "product," by means of the awareness raising tools, has repercussions for the development self-organisation in learning.

(c) The overall result (theory or model) offers teachers a framework within which to operate. The "specific process" and "general capacity for process" models leads to an appreciation of how individuals pursue alternate paths and purposes.

This decade marks yet another crossroads in the changing pattern of educational ideologies. Conservative tenets have failed because these are based on a pessimistic view of man. Fixed within his genetic inheritance and imprisoned within a rigid and powerful social hierarchy, in which he strives to identify himself, man's freedom is limited. At best this approach has achieved a status quo between man and his environment, at worst it has resulted in alienation. A science of conversational techniques can open up new perspectives and offers a substantial step towards realising

the radical tenet that "man can make man." Sufficient evidence already exists that conversational procedures can help man to manage his environment more effectively (Bannister, 1962; Bruner, 1964; Friere Paulo, 1974; Kelly, 1955; Pask, 1969).

Implications for the Study of Cognition

The techniques of the psycholinguist and of the experimental psychologist restrict the type of data they allow to contribute to theory. Sociologists such as Bernstein (1969) and Labov (1966) and anthropologists such as Levi-Strauss (1966) do tap natural language, but their methods have been criticised for being too anecdotal (Coulthard, 1969). Conversational method uses "hard" tools to study natural language rigorously. It yields findings which are at variance with those arrived at by other methods. The many different meanings achieved in reading the same text demonstrate the existence of much more various and wide-ranging generative techniques than formal linguistic theories allow. Orthodox methods of investigation do not reveal this variety and thus conspire to perpetuate the myth of innate specific processes. Conversational data leads us to question this innateness and pushes the boundary between assumed neural hardwear and demonstrated experiential softwear back still further, beyond the rules of transformational grammar to the capacity for process itself.

Civilised man uses reading as a major tool in aiding and influencing his cognitive development. Conversational techniques can enhance this. If similar methods were adopted for investigating other highly practised areas of human competence, such as Art,

Mathematics and Decision making, the study of cognitive processes could break away from the armchair, the Clapham bus, and the laboratory, and venture out into the areas where man appears to function at his fullest.

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Conversational Investigations of Reading: New Insights into Cognition

Summary

Orthodox experimental methods based on classical statistics have restricted the psychological investigation of reading. A Conversational investigation based on whole texts, yields rich, detailed and uniquely individual data about the reading process. The text serves as a common referent, but the meaning attribution varies from person to person. A Cognitive model of the reading process must explain this phenomenon. Conversation investigations are"context sensitive", emphasise the uniqueness of the individual, and recognise that the act of observing influences the activity being observed. Mismatch between the preconceived meanings of the experimenter and the immediately conceived meanings of the subject, is used in the co-operative descriptive and explanatory exercise. Personal Construct Theory provides the underpinnings for the development of the conversation techniques and for the formulation of a model of the reading process.

The conversational method accepts the subject as full participant and uses his unique position as observer of his own internal events. An investigatory model and "hard" tools ensure the validity and reliability of the enterprise. The observations reveal the variety, flexibility and complexity of the reading process. It becomes necessary to postulate "Specific process" and "Capacity for process" models to explain the data. Four "Specific process" models are discussed: probabilistic, phrase structure, transformational and semantic generative models. A semantic model accounts for the reader's ability to use context cues and his ability to generate an infinite variety of purposes. No one coherent "Specific process" model is adequate. The existence of a whole "computer" library

of specific processes is postulated. These serve to formulate the dimensions of a "Capacity for process" model, capable of running all the programmes in the library. A heterarchical generative "Capacity for process" model can account for the attribution of an infinite variety of "Structures of Meaning" to a text. The model described shows how levels of meaning are connected in the network. The model is offered as "hardwear", but it is recognised that as new discoveries are made, this may be relegated "softwear" status.

The model is compared with Chomsky's competence model. The existence of specific innate structures such as phrase structure and transform rules is questioned.

The conversation tools, investigatory model and procedures are described. The Kelly repertory grid and the Thomas grid focusing technique makes explicit the reader's background needs and assumptions. A taxonomical description facilitates the reader's articulation of purposes. The Brunel Reading Recorder identifies strategies of reading behaviour. A Flow diagram technique and a "Meaning net technique" displays reading outcomes. A "Purpose-Strategy-Outcome-Review" investigatory model provides a framework for the investigation. The conversational procedure can be used to encourage effective change in reading performance. It becomes trimorphic. Three forms of dialogue combine and interrelate in the conversational events. These are "Commentary on Process", "Supporting the Reader's Reflection" and "Referents for evaluating Competence".

The implications of the findings of the "Conversational" study are considered for Education and for studies in Cognition.